

CLAIMS

1. A catalytic converter system comprising:  
an upstream substrate having an upstream catalyst disposed thereon, wherein greater than or equal to 70 wt% of the upstream catalyst is disposed at a core of the upstream substrate, wherein the weight percent is based on a total weight of the upstream catalyst disposed on the upstream substrate.
2. The catalytic converter system of Claim 1, wherein the upstream substrate is configured to receive greater than or equal to 60% of an exhaust flow volume through the core.
3. The catalytic converter system of Claim 2, wherein the upstream substrate is configured to receive greater than or equal to 70% of the exhaust flow volume through the core.
4. The catalytic converter system of Claim 1, wherein a closed-couple converter comprises the upstream substrate.
5. The catalytic converter system of Claim 1, wherein the upstream substrate is a rounded substrate.
6. The catalytic converter system of Claim 1, wherein greater than or equal to 50 wt% of the upstream catalyst is disposed at a reduced core having a diameter less than or equal to 44% of an overall diameter of the upstream substrate.
7. The catalytic converter system of Claim 6, wherein greater than or equal to 30 wt% of the upstream catalyst is disposed at a second reduced core having a diameter less than or equal to 30% of the overall diameter of the upstream substrate.
8. The catalytic converter system of Claim 1, wherein an upstream converter comprises the upstream substrate, an inlet end, and an outlet end, wherein the inlet end comprises an endplate.

9. The catalytic converter system of Claim 8, wherein an exhaust conduit is coupled to the end plate at an angle  $\theta$  of about 90 degrees to a face of the end plate.

10. The catalytic converter system of Claim 1, wherein in the system is capable of obtaining a light-off in less than or equal to 25 seconds.

11. The catalytic converter system of Claim 1, further comprising a downstream substrate in fluid communication with an upstream substrate, wherein the downstream substrate comprises a downstream catalyst disposed thereon, wherein greater than or equal to 60 wt% downstream catalyst is distributed at a bulk of the downstream substrate.

12. The catalytic converter system of Claim 11, wherein greater than or equal to 80 wt% of the downstream catalyst is distributed at the bulk of the downstream substrate.

13. The catalytic converter system of Claim 11, further comprising an under-floor converter comprises the downstream substrate.

14. The catalytic converter system of Claim 11, wherein the under floor converter comprises an inlet portion configured to cause turbulent flow in the downstream substrate.

15. The catalytic converter system of Claim 14, wherein the inlet portion comprises an endcone.

16. The catalytic converter system of Claim 11, wherein the upstream substrate and the downstream substrate are disposed in a housing, wherein a gap is disposed between the upstream substrate and the downstream substrate sufficient to create turbulent flow in the exhaust fluid prior to entering the downstream substrate.

17. The catalytic converter system of Claim 16, wherein the gap is up to about 20 mm in length.

18. The catalytic converter of Claim 17, wherein the gap is about 10 mm to about 20 mm in length.

19. A method of making a catalytic converter, the method comprising:

disposing an upstream catalyst on an upstream substrate; and  
drying the upstream substrate, wherein greater than or equal to 60 wt% based on a total weight of catalyst disposed in the upstream substrate is disposed at a core of the upstream substrate.

20. The method of Claim 19, wherein the upstream substrate is dried with a microwave drier.

21. The method of Claim 19, further comprising disposing a downstream catalyst on a downstream substrate; and drying the downstream substrate, wherein greater than or equal to 60 wt% based on a total weight of the catalyst disposed in the downstream substrate is distributed at a bulk of the downstream substrate.

22. The method of Claim 21, wherein the downstream substrate is dried in an oven.

23. The method of Claim 21, further comprising disposing a retention material around the upstream substrate and the downstream substrate such that the retention material is between a housing and the upstream substrate and the downstream substrate, and wherein a gap of up to about 20 mm is created between the upstream substrate and the downstream substrate.

24. A catalytic converter system comprising:  
an upstream substrate capable of maintaining laminar fluid flow  
therethrough; and  
a downstream substrate in fluid communication with the upstream  
substrate, wherein the downstream substrate is capable of maintaining turbulent flow at  
least through a portion thereof.

25. The system of Claim 24, wherein the upstream substrate  
comprises a rounded shape and an upstream catalyst disposed thereon, wherein greater  
than or equal to 60 wt% based on a total weight of the upstream catalyst is disposed at a  
core of the upstream substrate; and wherein the downstream catalytic downstream  
substrate comprises a downstream catalyst disposed thereon, wherein greater than or  
equal to 60 wt% based on a total weight of the catalyst material disposed on the  
downstream substrate is distributed throughout a bulk of the substrate downstream  
substrate.